

Running Head: ADVICE AND TRIAGE LINE AT IACH

The Cost of Implementing a Combined

Advice and Triage Line:

Irwin Army Community Hospital

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### Abstract

Under the current contract between the Department of Defense TRICARE Support Office and TriWest Healthcare Alliance, Corporation, TriWest is required to provide a telephonic self-intervention or self-care program. This requirement is currently being met through a subcontract with Optum NurseLine for the TRICARE Line for Care, a 24 hour nurse advice line. The same contract requires Irwin Army Community Hospital (IACH) to provide patients with 24 hour access to a Primary Care Manager. This study researches the cost of implementing a 24 hour combined advice and triage line at IACH in order to fulfill both of these requirements. The projected cost was determined by the anticipated call volume, necessary staffing, cost of the staffing, and the cost of purchasing a developed software program. The annual cost of implementing this service would be \$437,567. This cost shared by IACH and TriWest, with IACH funding an amount equal to the cost of the current triage line (\$144,628). The remainder (\$292,939) is the amount for which TriWest could subcontract with IACH to meet their contract requirement. This cost was found to be competitive with other services as reported in current literature. The benefits to the patients of IACH are discussed along with the importance of patient satisfaction under enrollment based capitation.

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## The Cost of Implementing a Combined Advice and Triage Line:

### Irwin Army Community Hospital

#### Introduction

##### Conditions which prompted the study

The Department of Defense (DOD) TRICARE Support Office contract with TriWest Healthcare Alliance, Corporation went into effect at Fort Riley in April of 1997. There are two conditions within this contract that prompted this study. First, TriWest is to provide a telephonic self-intervention or self-care program (DOD TRICARE contract, Section J-2, Addendum B, 3.4.1). TriWest provides this service through a subcontract with Optum<sup>®</sup> NurseLine, a part of the Center for Corporate Health, a division of United HealthCare. Optum<sup>®</sup> NurseLine operates the TRICARE Line for Care (TLC), a Nurse Advice Line available to all TRICARE Prime beneficiaries in the Central Region. Secondly, beneficiaries enrolled in the managed care plan (TRICARE Prime) with the Military Treatment Facility (MTF) as their Primary Care Manager (PCM) must have authorization from the PCM if care is received outside the facility. This usually becomes an issue when enrollees are on leave outside the area and are in need of acute/urgent medical care after duty hours. It is outside the scope of the TRICARE contract to instruct enrollees to call TLC as the first step in accessing care after duty hours. Therefore, the MTF must provide 24 hour access to a PCM (Lead Agent, 22 July 1997).

There are three issues which make accomplishing this mission of providing after hours access to a PCM difficult. Primarily, in order to avoid misuse of physician skills and abuse of the system, the phone calls should be screened prior to being referred to a physician. The person who actually answers the phone needs to have appropriate clinical skills. There may be instances

when the call is inappropriate; for example, the caller may need to go to the ER immediately or may have called the line with a non-urgent/acute problem. A properly trained person would be able to identify these cases and handle them appropriately. Secondly, both the person answering the calls and the physician authorizing care need to have a baseline knowledge about the TRICARE contract and accessing care outside of the facility. Finally, unless the physician is physically present, this will necessitate an additional call roster for the physicians.

Unfortunately, this screening process can add to patient confusion and dissatisfaction. Under this screening system and TLC, a patient may call TLC and be told they are in need of urgent care and should seek care at a free-standing walk-in facility with extended hours (Optum<sup>®</sup> NurseLine Glossary, course of action for urgent care, August 1997). If the patient is on leave outside the area, they must then call the PCM to receive authorization to see a non-network provider. When they call the number provided by the facility, they must explain the situation again to the individual screening calls for the physician. The physician will surely have additional questions and need further explanation when they eventually speak with the patient. Therefore, continuity of care and ease of use need to be addressed when assessing the alternatives to this problem.

Irwin Army Community Hospital (IACH) is struggling with how to provide this access without putting additional burdens on the staff. IACH currently staffs four areas after duty hours: the Emergency Room (ER), the ambulance section, the inpatient wards, and the Administrative Officer of the Day (AOD)/Assistant AOD (AAOD). Several options to meet this access requirement have been discussed and have not been found to be feasible.



The only one of the staffed areas with both a physician and clinical staff on duty is the ER. Several problems arise with this option. The ER is currently staffed at a minimal level after duty hours and on weekends. Due to the nature of business conducted in the ER, the staff cannot accept additional responsibility without additional staffing. Workload in the ER can be very unpredictable and the staff may not be able to respond to the phone lines during times of peak workload or true emergency treatment. Physician staffing in the ER is accomplished through a resource sharing agreement with TriWest. Therefore, the methodology used for counting this telephone workload may have an affect on the Bid Price Adjustment for the contract. Also, the difficulty in maintaining physician coverage has resulted in numerous providers covering the ER at different times and for different lengths of times. This could cause some confusion on the part of the physicians with regard to how the TRICARE system works and ultimately the information that is passed on to the patient.

The ambulance section is situated so that they are an extension of the ER. It is not feasible for the ambulance section to field these calls because of their primary commitment to respond to emergencies as needed. The staff is also on a schedule of 24 hours on / 48 hours off. This schedule requires a sleep schedule for the Emergency Medical Technicians (EMT). The EMTs also assist in the ER when not out on a call. The EMTs have access to the ER physician, but the difficulties regarding utilization of the ER physician to accomplish this mission remain.

Although the nursing staff on the inpatient wards have the knowledge base to field these calls, there is only one RN on each ward after duty hours. IACH has combined services so that only three wards are operating; ICU, Postpartum/Newborn Nursery, and Medical / Surgical / Pediatrics. The inpatient census and acuity varies greatly on a daily basis and the nurse may not

have the time to allocate to this function. Additionally, if there are no patients on a particular ward overnight, the staff, other than the RN, may be sent home.

The AOD function is filled on a rotating basis by Noncommissioned Officers and junior officers (Second Lieutenant to Captain) from every section within the facility. Therefore, the AOD does not necessarily have adequate clinical knowledge to screen the incoming calls. The AOD is also performing duties throughout the hospital during the night and is not always accessible by telephone. The Assistant AOD (AAOD) is also a rotating duty that is performed by enlisted soldiers. Although they should be available when the AOD is out of the area, they also have additional duties outside the facility. The majority of these soldiers will have no clinical skills at all. All of these options would require additional training on specific areas of the TRICARE contract. The AOD/AAOD option would require additional training for all service members in the facility, which is extremely difficult with the turnover of military personnel.

#### Statement of the problem

The remaining option is to staff the access line after duty hours with a new duty position capable of screening the calls and contacting an on-call physician when authorization is needed. The problem that prevails is how to fund this position. The budget for IACH has decreased 27% from Fiscal Year 1995 (FY95) to FY97. The civilian end strength has also decreased 27% over the same time period. At the same time, the user population has only decreased 14% (IACH Command Briefing, 10 Sep 1997). IACH recently went through a Reduction in Force (RIF) and lost several employees. The resources at IACH are currently stretched to their limit, both in workload and finances.

IACH currently has a primary care triage line which is staffed by three Registered Nurses (RNs). This line is only staffed during duty hours. The RNs receive telephone consults from the TRICARE appointment line for patients requesting a same day appointment. The RNs will then call the patient back with an appropriately scheduled appointment. They will also try to work in patients who walk-in without an appointment. The Pediatric Clinic operates a Pediatric Advice Line (PAL) which operates in a manner similar to the triage line. The PAL does not have dedicated staffing, the calls are handled by the head nurse of the clinic or a provider. The function of these two services is very similar to the TLC but with the added capability of making appointments and writing prescriptions for over the counter medications available at the pharmacy. It would be ideal to expand this service to include after-hours access and approval authority for out of area authorizations for the PCM. The question that surfaces is: If TriWest would subcontract with the MTF for the nurse advice line, could the MTF accomplish both the access mission and the requirement to provide a health care advice system simultaneously at a cost cheaper than providing the PCM access separately.

#### Literature review

TRICARE Prime is the health maintenance organization (HMO) option in the Military Health System. As such, utilization management is a critical function to reducing health care costs. Demand management is one aspect of utilization management. Activities which fall into the arena of demand management are those "designed to reduce the overall requirement for health care services by members" (Kongstvedt, 1996, p. 249). According to Kongstvedt, demand management activities can be divided into five categories: nurse advice lines; self-care and medical consumerism programs; shared decision making programs; medical informatics; and

preventive services and health risk appraisals (p. 250). Nurse advice lines are frequently referred to as "triage lines". The two terms will be used interchangeably throughout this paper.

Triage is defined as "the screening and classification of sick, wounded, or injured persons during war or other disasters to determine priority needs for efficient use of medical and nursing manpower, equipment, and facilities" (Dorland's, 1994). The idea of triage was first implemented with this definition during World War I. Although this definition centers around times of war or other disasters, triage is equally necessary in peacetime facilities.

The use of triage in peacetime settings is partially a result of the rising cost of health care. Controversy over whether health care is a right or privilege has existed since the revisions in social and health policies in the 1960s and early 1970s. Based on these changes, many patients view the emergency room as an extension of services to meet all their health care needs, not just emergent ones (Franco, Mitchell, & Buzon, 1997). The percent of emergency room visits which are for nonurgent problems has been found to be as high as 75% (Franco et al.). While the misuse of emergency rooms is often viewed as a new problem, the first documented abuse of emergency rooms appeared as a letter in an 1869 edition of the *Lancet* (Buckles, & Carew-McColl, 1991). Currently, Americans make more than 90 million emergency room visits each year, at a cost of over \$5 billion each year (Hage, 1997). As a cost saving mechanism, triage in the managed care environment has come to involve "prioritizing clients' health problems according to their urgency, educating and advising clients and making safe, effective and appropriate decisions" (Coleman, 1997).

The practice of performing triage over the telephone has taken place informally since the invention of telephones. "Mr. Watson, come here, I want you" the first telephonic message by Alexander Graham Bell is infamous. However a little known fact is that this was a call for

medical assistance, Bell had spilled sulfuric acid on his clothes (Grumet, 1979). Just three years later in 1879, the *Lancet* records one of the first telephonic interactions between a physician and a parent and a child with an upper respiratory infection.

A physician called at midnight,...asked to be put in telephonic communication with the anxious mamma. "Lift the child to the telephone" he commanded, "and let me hear it cough". Both the mother and child complied. "That's not the croup", the doctor declared...and all anxiety quieted, the trio settled down happily for the night (Grumet, 1979).

Private practice physicians were quick to incorporate the telephone into their offices. In fee-for-service systems, the telephone call can be an avenue to entice the patient into making an office visit.

The first widespread applications of the telephone was for crisis intervention. The Telephone Samaritans began the first suicide prevention hotline in 1953 in London. The idea spread to the United States in 1958. Numerous other crisis prevention centers implemented these hotlines, including poison control centers, drug hotlines, teenage hotlines, and telephone services for the elderly (Grumet). In the 1970's HMOs began to implement telephonic gatekeeper services as a cost control mechanism. The first "24-Hour Nurse Advice" program was developed in 1984 by the emergency department in a small northwest hospital (Wheeler & Windt, 1993). The hospital based telephone referral services and telephone triage programs are effective marketing programs for both hospitals and health systems (Lester & Breudigam, 1996).

Over one million calls per month are made to advice hotlines throughout the United States each month (Williams, Crouch, & Dale, 1995). These calls make up an estimated 12-28 percent of the primary care delivered in the United States (Dale, Crouch, & Williams, 1995;

Yanoviski, Yanoviski, Malley, Brown, & Balaban, 1992). As one of the fastest growing aspects in healthcare, 25 % a year, it is estimated that 100 million people will have access to telephone triage systems by the year 2001 (McCarthy, 1997). The savings which could be realized from the expansion of triage lines is estimated at \$7 billion per year (Dale & Crouch, 1997).

The financial savings realized in the managed care plans come from improved patient access and proper utilization of services. Several studies have been conducted to determine the effect of triage lines on emergency room utilization. A five year study of a triage line in Victoria, Australia, found that 42% of the calls were advised to go to the emergency room (Edmonds, 1997). A 1991 study of the Harvard Community Health Plan (HCHP) After Hours Telecommunications Program found that 30-40% of their calls resulted in visits to the emergency room (Wilkinson, Sansby, & Leaning, 1991).

The ER referral rates for pediatric programs appear to be much lower. Triage lines using programs from the National Health Enhancement Systems have shown findings that 60% of the after hours calls involve a pediatric patient (Hesselgrave, 1997). Atlanta's Egleston Children's Health Care System's On Call line was implemented in 1994 and reports the lowest emergency room referral rate of 12% ("Telephone advice lines: worth", 1996). A study conducted on an area-wide telephone triage and advice system for pediatric practices in the Denver area found that 20% of the patients were referred for an after-hours patient visit (Poole, Schmitt, Carruth, Peterson-Smith, & Slusarski, 1993). The Pediatric Telecommunications portion of the HCHP After Hours Telecommunications Program has reported 20-25% of those calls result in an emergency room visit (Wilkinson et al., 1991).

A 1991 survey of parents using a triage line indicated that 74.9% would have gone to an emergency room if the phone service had not been available (Williams et al., 1995). This

reduction in emergency room utilization is significant when looking at the cost per visit versus the cost of operating a triage line. The literature available on cost data views the costs in a variety of methodologies. Palomar Pomerado Health Systems in San Diego has accepted that their service costs between \$20 and \$30 per call ("Teletriage", 1997). A cost study on the triage system in the New Brunswick Health Care Center estimates savings at \$187,000 per year. These savings represent only those patients who are referred to a free-standing clinic rather than a hospital emergency room, they do not include those who avoid after-hours care and seek routine appointments (Roberts, Lucid, & Rovner, 1991). A review of the Hotline for the Hospital for Sick Kids in Toronto has found a cost per call of less than \$10 while a typical visit to a Toronto emergency room costs \$100 (Clasper & McGrath, 1993). The HCHP After Hours Telecommunications Program figures their operating costs at \$0.36 per member per month for the adult program and \$0.24 per member per month for the pediatric program (Wilkinson et al., 1991). The financial evaluation of the After Hours Program in Denver shows the relative cost per phone call decreasing as volume increased, \$10 in 1989 to \$8.25 in 1991 (Poole et al., 1993). The volume nearly doubled in this time frame. Some facilities, such as Egleston Children's Hospital in Atlanta view the service as a loss leader due to the staffing requirements. However, they continue the program based on the notable benefits in the public relations arena ("Telephone advice lines can", 1997).

Although centralized triage services may be more cost efficient based on the volume of calls which can be received, decentralized services can be more patient friendly. The Internal Medicine Department at the Ochsner Clinic developed its own service because of the inability of the clinic service, Ochsner-On-Call, to authorize renewals of prescriptions and the limited interim care they could recommend. The department also felt their patients were "going through

triage twice: once at the call center, a second time in the department" (Grandinetti, 1996). Park Nicollete, a Minneapolis multispecialty group practice, has a phone triage service which attempts to "effectively manage the interface between the patient's expectations and clinical needs" (O'Connor, 1996). This service provides the patient the opportunity to schedule an appointment, should they feel they cannot manage with the advice provided. The service also allows for requested information or literature to be mailed to the patient the following day. The Telephone Triage Program at City of Hope National Medical Center, Duarte, California, is described as providing the patients with "a personalized and efficient flow through the system" ("Telephone triage", 1995). The result of these programs which attempt to provide this seamless integration is increased patient satisfaction, such as at Egleston, which reports patient satisfaction over 99% ("Telephone advice lines can", 1997). A 1996 survey of the Patient Advisory Nurse Service at the Carle Clinic in Illinois reports that 95.4% of their callers would recommend the service to others (Lowes, 1997).

The presence of a triage line outside the emergency room can also improve the morale of the staff working in the emergency room. Geraci and Geraci conducted a 72 hour observational study of triage nurses in an emergency room. The results dealing specifically with the telephone activities of these nurses found that they spent 22% of their time on the telephone.

During the 72-hour period, the nurses either received or sent 655 calls; 513 (78%) were incoming, 133 (20.3%) were outgoing.... Of all calls, 45.5% were clinic related; 24.7% were ED [Emergency Department] related; 28.9% were classified as other; and 0.9% were not captured. Most calls (46.7%) occurred during the evening shift (3 pm to 11 pm), which was concurrent with peak triage census – when 39.3% of all patients were seen for triage (1994).



The study also found that 54% of the patients receiving physical triage in the emergency room were interrupted by the telephone or unrelated triage functions. Of the interrupting telephone activities, incoming calls requesting advice or clinic information were most frequent.

In planning for a triage line it is necessary to anticipate the volume and types of services needed in the program. Data is available on the total number of calls, but varies greatly based on the number and type of beneficiaries served. Many studies have documented the volume by time of day and have found the peak calling times to be during the evening hours (Dale & Crouch, 1997; Edmonds, 1997; Poole, et al., 1993). Both Poole, et al. and Edmonds found that the weekends showed a higher volume of calls than weekdays. A five year study of 23,142 calls to a triage nurse showed 79% of calls were placed outside of the normal business hours (Edmonds, 1997). This study found that Saturday and Sunday recorded the highest number of calls during the week. Mondays were slightly higher than the remaining weekdays and the researchers contributed this to the number of public holidays observed on Mondays. Edmonds' findings also showed peak calling times between 2000 and 2300 hours. A smaller study of 400 calls by Dale and Crouch showed peak calling times between 1800 and 2000 hours (1997).

Tracking the calls by type has shown that 75.6% of the calls are for medical problems, 8% for questions involving medications, and 3.8% for questions regarding tests or investigations (Edmonds, 1997). Also available is data on the profile of the caller which indicates the majority of callers (63%) were female (Dale & Crouch, 1997). Analysis also indicates the average length of calls at 6.7 minutes (Dale & Crouch, 1997).

All the literature emphasizes the legal liability involved with providing advice over the telephone. The position statement of the Emergency Nurses Association states:

ENA believes that in the best interest of the patient, the nurse should not render opinions regarding diagnosis or treatment over the telephone....ENA recognizes that some institutions have developed sophisticated telephone triage programs. These programs should be predicated on clearly defined protocols with medical direction by experienced, professional emergency staff members. Staff members should have specialized education in triage, telephone assessment, legal aspects and limits and capabilities of the service. A quality assurance program is essential to assure quality control of the telephone triage program (Wheeler, 1993).

Several software programs are available that provide algorithms at a wide range of prices. Centramax.M Plus, a software program by the National Health Enhancement Systems (NHES) can be "customized for demographic and geographic needs and adjusted to certain practical guidelines specific to a customer's region" (Hesselgrave, 1997). Healthwise Company offers a software program, Knowledgebase™, which includes a description of health problems, references on medical tests and procedures, and an electronic drug reference in addition to the decision making guide. This particular program can be installed on individual workstations on a local area network. Knowledgebase™ is purchased as a yearly subscription and includes quarterly updates (Hesselgrave, 1997). Whether a program should be purchased or developed internally should be based on the needs of the facility implementing the triage program.

The policy of the American College of Emergency Physicians (ACEP) on providing telephone advice from the emergency department states "ACEP recommends that such advice only be given by a designated service or health care provider trained in the relevant medical and legal ramifications" ("Providing", 1996). Based on this guidance, there are four safeguards to be

considered when implementing a telephone triage program: clinically sound guidelines, trained staff, documentation, and personal review of the advice (Grandinetti, 1996).

### Purpose

This project began with the intention of comparing the current cost of TriWest's subcontract with Optum<sup>®</sup> to provide a 24 hour advice service to the cost of providing this service at IACH. Unfortunately, cost data was not available from TriWest. This information is considered proprietary. The focus then shifted to determining IACH's cost to provide this service in house and what portion of that could be funded under a contract between TriWest and IACH. This information could be compared to other cost information found in the literature review. Although this information will not tell which service is more cost efficient, it will enable the facility to determine if the cost is competitive with the market. If so, the information could be presented to TriWest for consideration.

### Method and Procedures

The methodology used to determine the cost of operating the current triage line was based on the current staffing of the primary care triage line. This included determining both the salary and benefits package for the current staff. The U.S. Office of Personnel Management General Pay Scale for fiscal year 1998 was used to determine both the annual salaries and hourly rates. An assumption made when determining the benefits package was that the staff members are receiving the maximum benefit options. The benefits package includes the following: Federal Employees Retirement System (11.4%), Thrift Saving Program (5%), Federal Insurance Contribution Act or Social Security (6.2%), Medicare (1.45%), health insurance (\$135 per pay period), and life insurance (\$5 per pay period). The cost of the PAL was not included because

this service does not have dedicated staff. The opportunity cost of this service is in the decreased access in the Pediatric Clinic because the back-up provider or Nurse Practitioner are on the phone rather than seeing patients.

The methodology for determining the cost of expanding this service began with determining the necessary staffing based on projected utilization of the service. The distribution of calls would be based on the application of call distribution patterns as reported in the literature. The cost of this staffing was then determined by the grade of the employees, the appropriate salaries, and the number of hours receiving night differential, Sunday, and holiday pay. Night differential (10% of the hourly wage) is paid between the hours of 1800 and 0600, Sunday pay includes an additional 25% of the hourly rate, and the holiday pay is double the hourly rate. Once again, the assumption was made that the staff members would be receiving a full benefits package.

Also included in the cost of expanding this service was the possibility of purchasing a subscription to a software program with developed clinical protocols. Overhead costs, such as space, utilities, and computer systems, were not calculated as space and equipment are already dedicated to the triage nurses and would not be passed on to TriWest. The current equipment and space allocated within the facility could absorb the expanded mission. The staffing would have at most three nurses working during one shift, which is equivalent to the current staffing.

The cost of the current triage line was then subtracted from the entire cost of the expanded services. This is the amount for which TriWest could subcontract with IACH to provide this service.

The cost was then figured in several different methodologies which would allow for comparison to other services. Dividing by the number of beneficiaries gives a per beneficiary

per month figure. Dividing by the number of calls results in a cost per call. Calculating the number of minutes (based on the average length of TLC calls) will result in the cost per minutes of service. These three methodologies are the common basis for cost found in the literature.

## Results

### Cost of current triage line

The current triage line at IACH is staffed by three Registered Nurses (RN). These positions are Civil Service General Schedule employees grade nine with step increases based on longevity (GS-09/01). Currently, two of the RNs are at the GS-09 level (one GS-09/03 and one GS-09/04). The salaries for these nurses are \$34,024 and \$35,088, respectively. The remaining RN is on a save pay program due to the recent Reduction-In-Force (RIF). Therefore, he is paid as a GS-10/04, the grade of his position prior to the RIF. The salary for this nurse is \$38,640. The benefits package totals 24.05% of the annual salary and \$3654 per year for health and life insurance per employee. The annual cost to provide this service is \$144,628.35 (see Table 1).

### Workload determination

The TLC utilization of IACH beneficiaries was determined based on the Optum<sup>®</sup> NurseLine Utilization Report for the months of May 1997 through January 1998. The calls are divided into three main groups: symptom based topics discussed with a nurse; health information topics discussed with a nurse; and health information topics with the audio library. For the purpose of this study, the calls classified as health information topics discussed with a nurse and with the audio library have been combined as calls for health information. The symptom based calls are given one of the following recommendations: self care, call MD/Dentist in 24-48 hours,

call MD now, MD office visit, urgent care, emergency room, 911, and other (includes call poison control). The recommendation of "call MD in 24-48 hours" was added in September 1997. The definition of an urgent care recommendation is "due to the time and day, or the need for same day care when a medical doctor was unavailable, seeking care at a free-standing walk-in facility with extended hours was recommended." The recommendation of "MD office visit" is that the patient should discuss the symptoms at their next office visit. Based on this data, the total number of calls received over the nine month time period was 2988. The calls per month ranged from 244 (June) to 521 (January), with the average number of calls per month being 332. The total number of calls per month has been increasing at a rate of 27.58 calls per month. The total number of calls requesting information only was 962. On a monthly basis, number of calls requesting information only ranged from 75 (November) to 170 (August), with the average being 106.89 (33% of total calls). The number of calls requesting information has been decreasing at a rate of 4.82 calls per month. The total number of calls receiving symptom based advice was 2066. On a monthly basis the number of calls receiving symptom based advice ranged from 100 (June) to 427 (January), with an average of 229.56 (67% of total calls). These calls have been increasing at a rate of 32.40 calls per month (see Figure 1). The total number of calls reflects the actual number of incoming calls, a call may be counted as both information and symptom based if the caller is given both advice and general information.

Those recommendations which advise the patient to seek immediate care with a physician include: call MD now, urgent care, emergency room, and 911. After hours and on weekends the only clinic open at IACH is the Emergency Room. Therefore, when given this advice, it is likely that the patient will call or visit the Emergency Room. Of those calls receiving symptom based advice, an average of 54.44% per month received advice to contact a physician immediately (see

Figure 2). The range of calls per month was 69 - 254 with an average of 127 calls per month. These calls increased at a rate of 20.22 calls per month.

The recommendations which would lead a patient to make contact with the physician within 48 hours was differentiated in September and includes those advising immediate contact and those advised to call their physician in 24-48 hours. The range of calls per month was 69 - 322. There was an average of 155.22 calls in this category each month, making up 64.02% of all calls receiving symptom based advice (see Figure 3). These calls increased at a rate of 29.1 calls per month. Currently, the number the patient is given to reach their PCM is the number to the Emergency Room. The ER staff must then take the patient's information and call the on-call physician, who can then return the patient's call.

Data from the Medical Expense and Performance Reporting System (MEPRS) was used to determine the current workload of the triage nurses. Currently the triage line is staffed from 0730 to 1600 hours Monday through Friday. The triage line is not staffed on federal holidays or training holidays. The three nurses totaled 7882 patient contacts during the four month period of August through November 1997. This averages to 1970.5 contacts per month.

In addition to the triage line, the workload from the PAL was required. The MEPRS data for this clinic totals 4074 telephone contacts during the months of August through November 1997. This equates to 1018.5 contacts per month.

The fourth element to determine anticipated workload was the number of calls requesting authorization of care when the patient is outside the area. The information regarding these calls is forwarded to the TRICARE Service Center (TSC), located within the facility. The TSC collects these authorizations and forwards them to TriWest Corporate Headquarters. This data

was collected over a three month period, December 1997 through February 1998. The average number of calls received per month was 72.86.

By compiling the monthly workload of these four areas, 332 calls for the TLC, 1970.5 patient contacts for the triage nurses, 1018.5 telephone contacts from the PAL, and 72.86 calls requesting out of area authorization, the anticipated workload for an expanded triage line would be 3393.86 contacts per month. The monthly increase in calls to the TLC was not included in order to offset those calls to the triage line which are a result of the recommendation of the TLC nurse to contact a physician within 48 hours.

#### Staffing determination

Although all contacts with the triage nurses are made during duty hours, it is anticipated that this distribution would expand if the service was available 24 hours per day. The calls requesting authorization were all placed outside of normal duty hours. The distribution of calls to the TLC by day of the week and time of day was unavailable. However, by applying the findings of Edmonds (1997) regarding the distribution of calls by the time of day (see Figure 4), it can be determined that approximately 70% of the calls would be made outside of our normal duty hours of 0730-1630 hours. This information was broken down even further into the three shifts typical of a nursing service providing 24 hour coverage. The day shift (0700-1500 hours) received 32% of the calls, evening shift (1500-2300 hours) received 45% of the calls, and night shift (2300-0700 hours) received 23% of the calls.

Based on the distribution of calls over the three shifts, it was determined that six nurses would be needed on a daily basis to appropriately handle the call volume. The day shift would require two RNs, the evening shift would require three RNs, and the night shift could be staffed



with one RN. It was further determined that this same staffing could adequately handle the slight increase in volume over the weekends and holidays. This staffing model would require forty-two shifts during the week. Each full-time nurse can work five shifts, requiring 8.4 nurses to staff this triage line 24 hours per day. In order to allow for vacation time, sick leave, and supervisory duties, nine full-time nurses would need to be hired to meet the staffing requirements. This staffing would also be able to appropriately handle additional calls should the trend of increasing call volume being experienced by the TLC continue.

#### Cost of staffing expanded service

The next step in calculating the cost was to determine how many hours would be paid on the night differential, Sunday, and holiday schedules. The required forty-two shifts are eight hour shifts, resulting in a total of 336 nursing hours per week. The hours were then broken down by shift: the day shift consisted of 112 hours, evening shift was 168 hours, and the night shift was comprised of 56 hours. The shifts were further separated by the number of hours (per week) in each shift receiving regular, night differential, and Sunday pay (see Table 2). This breakdown resulted in the following hours: 156 hours received regular pay, 132 hours received night differential pay, and 48 hours received Sunday pay. These hours were multiplied by the number of weeks per year (52) to determine the annual number of hours per pay type. The final step was to subtract the hours which would be paid as holiday pay (10 holidays per year). The final result was 7852 hours at regular pay, 6644 hours at night differential pay, 2496 hours at Sunday pay, and 480 hours at holiday pay (see Table 3).

The triage nurse positions are classified as GS-09 positions on our current Table of Distributions and Allowance. Based on the FY98 General Pay Scale, the annual salary for a GS-

09/01 is \$31,897 and the hourly rate is \$15.28. The salary, benefits package (24.05%), and insurance (\$3654) totals \$43,222.23 per employee. This pay for nine nurses totals \$389,000.07. The final step is to add the extra pay. The night differential, calculated at 10% of the hourly rate, for 6644 hours is \$10,152.03. The Sunday pay, at 25% of the hourly rate, for 2496 hours is \$9,534.72. The holiday pay, at double the hourly rate, for 480 hours is \$7,334.40. Thus, the extra pay totals \$27,021.15. The grand total for staffing the combined line with nine RNs at the GS-09/01 level is \$416,021.22 per year (see Table 4).

Because the current triage line is staffed with RNs at higher grade there is a difference between the cost of three RNs at GS-09/01 and the three current RNs. Three RNs at the GS-09/01 grade would be \$129,667. This is an annual difference of \$14,961 which needs to be included in the overall cost. The impact this would have on the extra pay cannot be determined without identifying the specific hours which would be worked by each nurse. However, this difference is believed to be small enough to be absorbed by the organization.

#### Cost of developed software program

The software package researched for this project was the Healthwise Knowledgebase™. This software is a Windows®-based application containing over 27,000 pages of information. It can be installed on stand alone personal computers (PC) or a network. The standard package includes symptom based topics, diagnosis based topics, People's Book of Medical Tests, and electronic versions of the Healthwise® Handbook and Healthwise for Life, and the American Self-Help Clearinghouse database. The optional package additions include: USP DI®, Volume II, Advice for the Patient® drug reference database from The United States Pharmacopeial Convention; The CancerNet™ cancer topic database from the National Cancer Institute; and Call

Manager™ software. The topic development process includes an ongoing review by the Healthwise Medical Review Board. This Board is comprised of board-certified specialists with academic appointments. An annual subscription includes quarterly updates. The subscription fees are based on the number of concurrent users on a network or stand-alone PCs. With 2-9 concurrent users, the cost per user for the standard package is \$1,829 and \$2,195 for the optional packages.

The specifications for installation on a networked system include those for both the server and the workstations. The server requirements are a Pentium-90 or faster, 32 MB RAM, CD-ROM drive, and a 3-1/2" disk drive. The workstations requirements are Pentium-90 or faster, 16 MB RAM, super VGA color monitor with a graphics accelerator with 2 MB RAM and 256 colors, mouse, MS-DOS 5.0 or higher, and Windows 95 or higher. These requirements can be met with the equipment currently installed in the facility. Therefore, additional equipment to support Knowledgebase™ will not need to be purchased.

On-site installation is available for an additional cost of \$1,000 per day plus expenses. However, installation can be accomplished by the staff of IACH's Automation Management Office (AMO) with the remote support of the Healthwise Technical Team. The technical support services are available 24 hours a day through a toll-free technical support line. The quarterly updates can be accomplished by the AMO staff as well. On-site training is also available at a cost of \$1,000 per day plus expenses. It is not anticipated that this training would be required.

The cost of implementing the Healthwise Knowledgebase software, with the optional package additions, is the annual subscription for the three computers used by the staff of the advice and triage line. The final cost of this subscription is \$6585.

### Cost to IACH and TriWest

Based on the cost of staffing the expanded triage line and an annual subscription for the Healthwise Knowledgebase™ software, the annual cost to provide a combined Advice and Triage Line at IACH 24 hours per day is \$437,567. IACH currently spends \$144,628 for the triage line and would continue to invest this amount. The remaining \$292,939 would be the cost to TriWest for subcontracting with IACH to provide this service (see Table 5). The monthly cost of this contract would be \$24,412. The current number of beneficiaries in the IACH catchment area is 35,689 (4 March 1998, IACH Managed Care Division). This is a cost of \$0.68 per beneficiary per month. With 3394 calls per month, the cost could be figured as \$7.19 per call. The average time spent on each call to the TLC in January 1998 was 7:13. At the anticipated volume of 3394, this equates to 24493 minutes of service or \$1.00 per minute of service. The cost per minute of service would probably decrease as the time to complete a call increases with the addition of scheduling appointments.

### Discussion

As noted in the literature review, the cost to TriWest for contracting with IACH to provide this service is very competitive with other companies that provide this service. While the cost is competitive with other programs, the largest benefit would be derived from patient satisfaction. The majority of the cost savings attributed to having an advice line and triage line have been met under the current system. The amount to be saved by combining the services at IACH is secondary to the increased access to the patients. The combined line creates a much more "user friendly" system for the beneficiaries. The combined line would also ease the burden

on the staff in the Emergency Room and the on-call physician by fulfilling the mission of having 24 hour access to a PCM for out of area authorizations.

Under the current system, patients who call the TLC after hours and need to be seen the following day must then call for an appointment the following day. The appointment line will then send a telephone consult to the triage nurse for a same day appointment. Because these lines do not open until 0730 hours, the triage nurses receive a large volume of calls in the morning and may not be able to return a patient's call for a few hours. Patients calling the Emergency Room for an authorization to receive care outside the area must also wait for a return call from the on-call physician. In both situations, the patient must wait for a return phone call and explain thier situation more than once (see figure 5).

The proposed 24 hour Advice and Triage Line at IACH would only require one phone call by the patient. After speaking with a nurse, if an appointment is needed the following day, the nurse would be able to make that appointment. If the patient was in need of some type of over the counter medication that would otherwise require a visit (for example, Dimetapp), the nurse could leave that prescription at the clinic front desk, avoiding a visit (see figure 6). Because the service would be available 24 hours per day the volume of calls received at 0730 hours and waiting for a return call would probably be reduced considerably to a manageable amount. As mentioned previously the access to same day appointments in the Pediatric Clinic would be increased since providers would be seeing patients rather than performing phone triage responsibilities. Patients calling for out of area authorization would receive that authorization or denial immediately. The number of calls forwarded to the on-call physician after hours would also be reduced.

Current literature suggests that anywhere between 12-42% of the calls to an advice line are referred to an emergency room. Currently the TLC advises an average of 54% of the calls to contact a physician immediately, and an additional 10% are advised to contact a physician within 48 hours. This combined service may be able to decrease these numbers and bring them back into the range reported in the literature. At the least, the combined service would make contacting the physician easier for the patient.

Patient satisfaction with both advice lines and triage lines has been well documented in the literature. Patient satisfaction with an advice line in a Military Treatment Facility has been researched at Reynolds Army Community Hospital, Ft. Sill, Oklahoma. The researchers found that the Health Care Advisor Program, which only operates during the day, has an overall satisfaction rating of 95% (Choate & Walton, 1997). However, this combined line at IACH would be more comparable to the services available at the Internal Medicine Department, Ochsner Clinic, and Park Nicollet. As discussed in the literature review, these two services are oriented to meeting the needs of the patient, to include making appointments and prescription renewals. This service would be more consistent with the idea of seamless integration which is being sought by many MCOs.

The four areas noted earlier by Grandinetti as safeguards for implementing an advice/triage program were clinically sound guidelines, trained staff, documentation, and personal review of the advice. The developed protocols of the Healthwise Knowledgebase™ program will assist IACH and TriWest in ensuring that the advice being given to patients is clinically sound. The Medical Review Board can provide a very time consuming process of developing clinically sound advice protocols. The quarterly updates will also assist in

maintaining current protocols. Should the organizations choose to have the content customized, the Knowledgebase™ staff will customize the program for an additional cost of \$150 per hour. The utilization of Registered Nurses trained with the software program and under the supervision of the Chief, Primary Care Clinics meets the criteria of appropriately trained staff. Documentation of the advice given can be made with either the Knowledgebase™ Call Manager™ software or the Composite Health Care System (CHCS) already in use at IACH. Regardless of which method is used, the documentation can easily be provided to the Patient Administration Division for filing in the patient's medical record. Because information regarding calls to the TSC currently are forwarded from Optum to TriWest and on to the TSC before they are passed to the physicians, a combined line will eliminate a number of intermediary steps and increase the timeliness with which the documentation is appropriately filed. Finally, by providing this service in the facility itself, the communication with the physician staff on any patient care issue is greatly enhanced. The physicians will be able to review the advice in a timely manner. Physicians will also be able to be informed of a patient seeking care, based on the advice of a nurse, prior to their arrival.

### Conclusions and Recommendations

A combined Advice and Triage Line at Irwin Army Community Hospital would greatly benefit both the staff and patients. This line would fulfill both the TRICARE requirement of the contractor, TriWest, to provide a telephonic self-intervention or self-care program and the requirement of the MTF to provide 24 hour access to a PCM. This venture would also enhance the spirit of partnership on which the contract between TriWest and IACH should be based. The TRICARE plan allows the patient to choose not only which type of managed care plan in which

they would like to enroll, but also what clinic (military or civilian network) they would like to have as their Primary Care Manager. Enrollment Based Capitation is a funding methodology in which the MTFs will receive a budget based on the number of beneficiaries enrolled in TRICARE Prime with the MTF as their PCM. As this is implemented, it will encourage the MTFs and TriWest to have the maximum amount of beneficiaries enrolled to the MTF as their Primary Care Manager. In order for the beneficiary to choose IACH, the facility must set itself apart in the service that is provided to the patient. A combined Advice and Triage Line is one way to stand out in customer service.

Although the cost of providing this service at IACH cannot be directly compared to the current contract between Optum and TriWest, for proprietary reasons, the projected cost is comparable to similar services found in the literature. Based on this competitive pricing, it would be in the best interest of the beneficiaries, staff of IACH, and the contractual relationship between IACH and TriWest to pursue this option with TriWest and the TRICARE Central Region Lead Agent.



## Tables and Figures

Table 1

## Cost of Current Triage Line RN Staffing

	GS 09/03	GS 09/04	GS 10/04
salary	\$ 34,024.00	\$ 35,088.00	\$ 38,640.00
benefits (24.05%)	8182.77	8438.66	9292.92
insurance	3654.00	3654.00	3654.00
total	\$ 45,860.77	\$ 47,180.66	\$ 51,586.92

Table 2

## Number of Weekly Hours Per Shift and Type of Pay

Shift	Hours by Type of Pay			Total
	Regular (0600-1800)	Night (1800-0600)	Sunday	
Day (0700-1500)	96	0	16	112
Evening (1500-2300)	54	90	24	168
Night (2300-0700)	6	42	8	56
Total hours per week	156	132	48	336

Note. Based on a model of two staff per day shift (0700-1500), three per evening shift (1500-2300), and one per night shift (2300-0700).

Table 3

Annual Hours per Type of Pay

	Regular	Night	Sunday	Holiday
Weekly hours	156	132	48	0
Weeks per year	52	52	52	0
Subtotal	8112	6864	2496	0
Adjustment for holidays	-260	-220	0	480
Total	7852	6644	2496	480

Note. Holiday hours based on 10 federal holidays per year. Each holiday contains 48 paid hours.

Note. Based on a model of two staff per day shift, three per evening shift, and one per night shift.

Table IV

Total Cost of Staffing Combined Line With GS-09/01 Registered Nurses

Salary	31,897 x 9 staff	=	\$287,073
Benefits	7,671 x 9 staff	=	69,041
Insurance	3,654 x 9 staff	=	32,886
Night Differential	6,644 hours x 1.528	=	10,152
Sunday Pay	2,496 hours x 3.82	=	9,535
Holiday Pay	480 hours x 15.28	=	7,334
<u>Total</u>			<u>\$416,021</u>

Note. Benefits package is 24.05% of the salary, night differential is 10% of the hourly rate (\$15.28), Sunday pay is 25% of the hourly rate, and holiday pay is double the hourly rate.

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Table 5Cost to TriWest for a Combined Advice and Triage Line at IACH

Staffing Costs for 9 RNs	\$416,021
Additional Cost for Current Staff	14,961
Knowledgebase Subscription	6,585
<u>Investment by IACH</u>	<u>(144,628)</u>
<u>Total Cost to TriWest</u>	<u>\$292,939</u>

Note. Additional cost for current staff is the difference in cost of staff at current grade and the cost of three RNs at the grade fo GS-09/01.

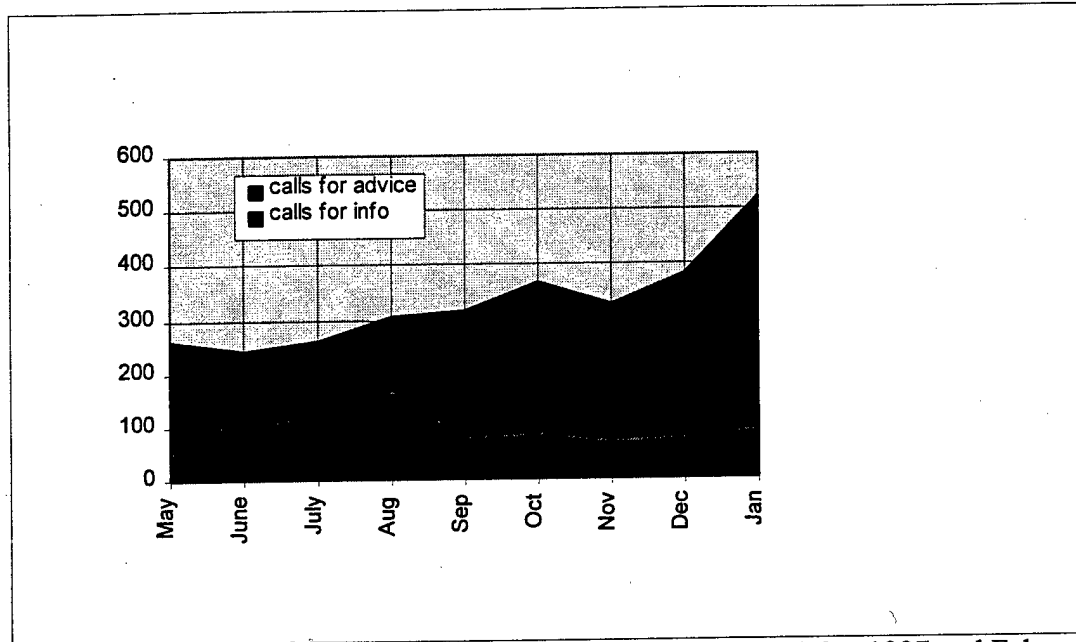
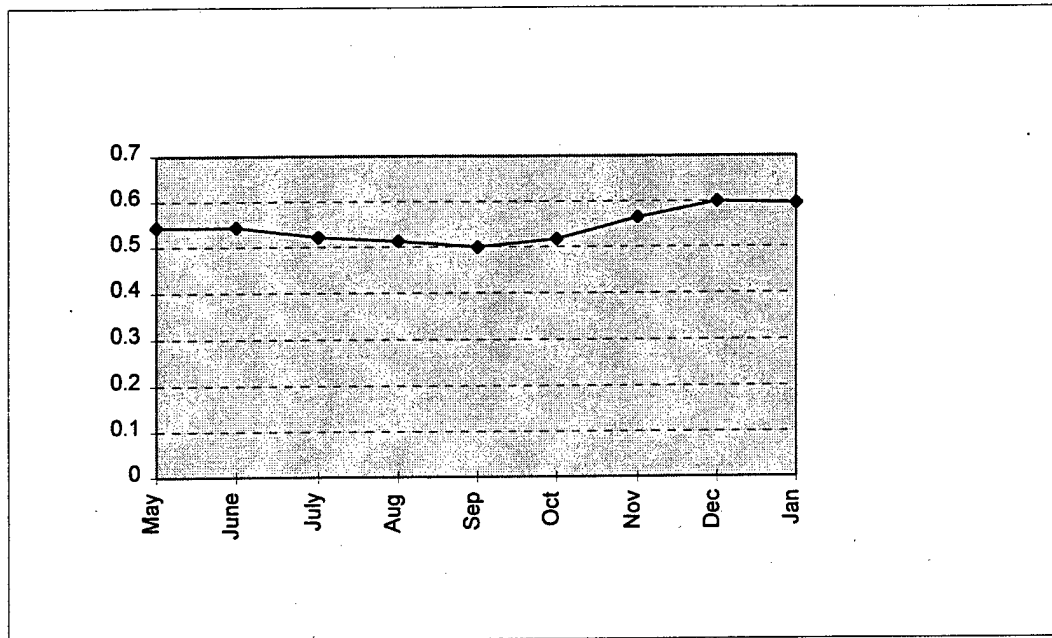
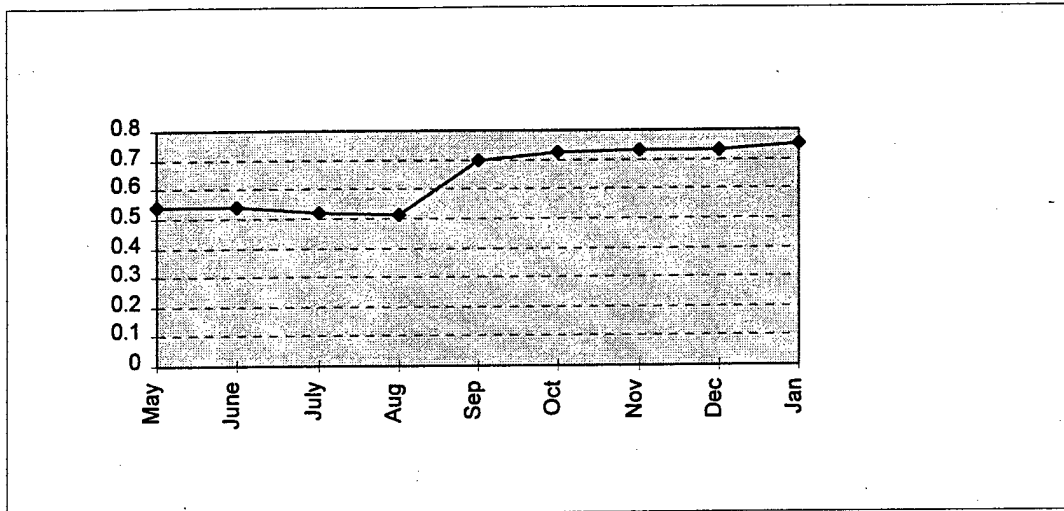


Figure 1. Total calls to the TRICARE Line for Care between May 1997 and February 1998.

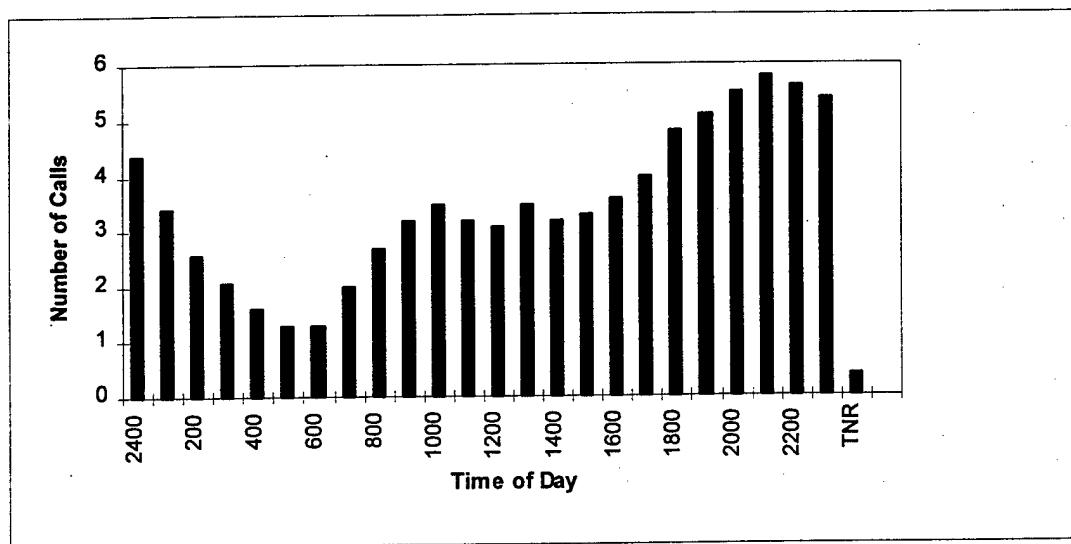


**Figure 2.** Proportion of symptom based calls to the TLC which were advised to seek immediate medical care. This advice includes the following recommendations: call physician now, seek care in an urgent care clinic, go to the Emergency Room, or call 911.



**Figure 3.** Proportion of symptom based calls that were advised to contact a physician within 48 hours. This advice includes the recommendations to seek immediate care and to contact the physician within 48 hours. The recommendation to contact a physician within 48 hours was implemented in September 1997.





**Figure 4.** Average number of weekly calls by the hour January 1991 - January 1996.

TNR = Time not recorded.

From "Telephone triage: 5 years' experience," by E. Edmonds, 1997,

Accident and Emergency Nursing, 5(1), p. 8.

# Flowchart of Current System

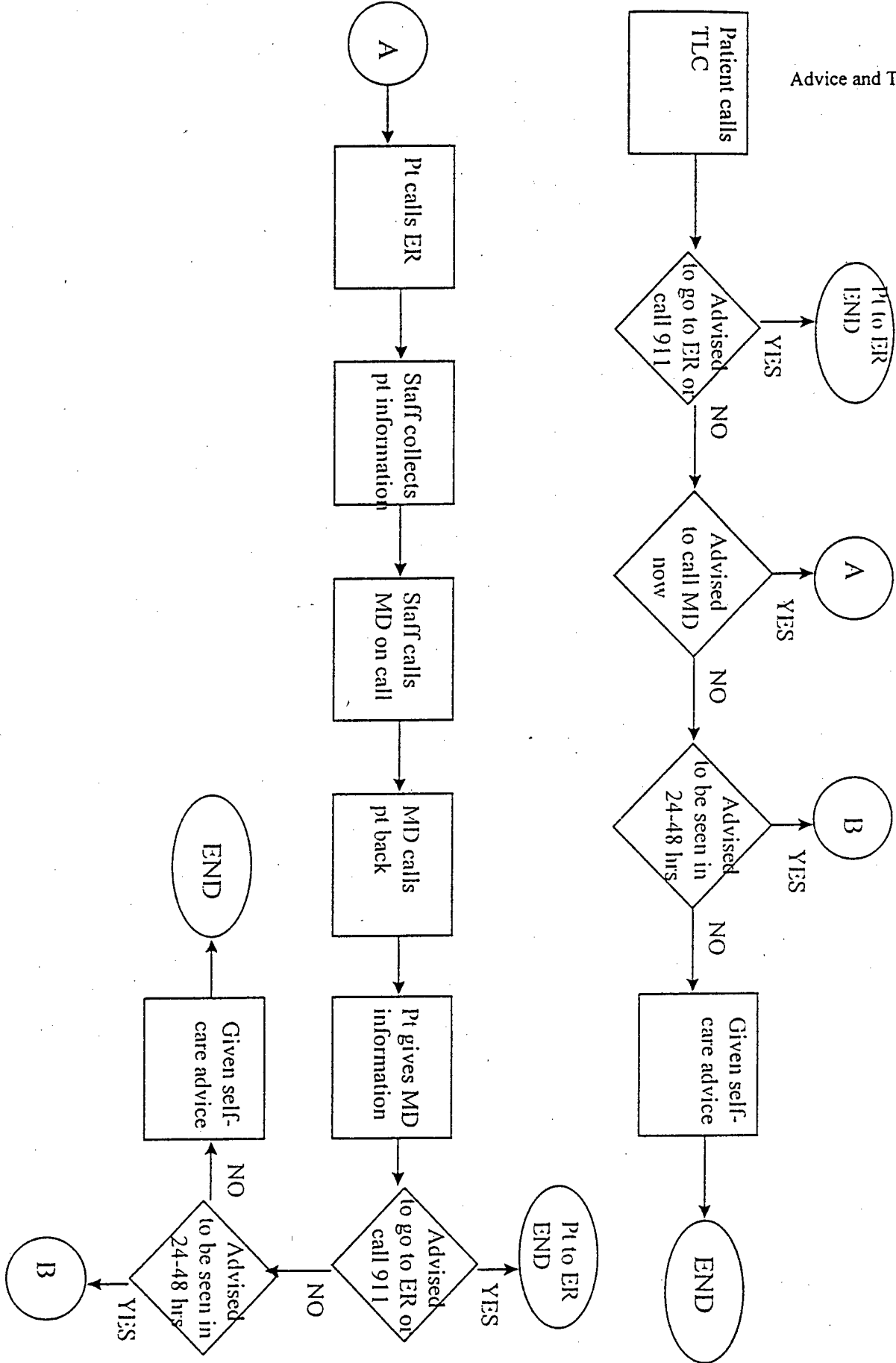


Figure 5. Flowchart of current patient encounters when calling the TLC.

Flowchart of Current System (con't)

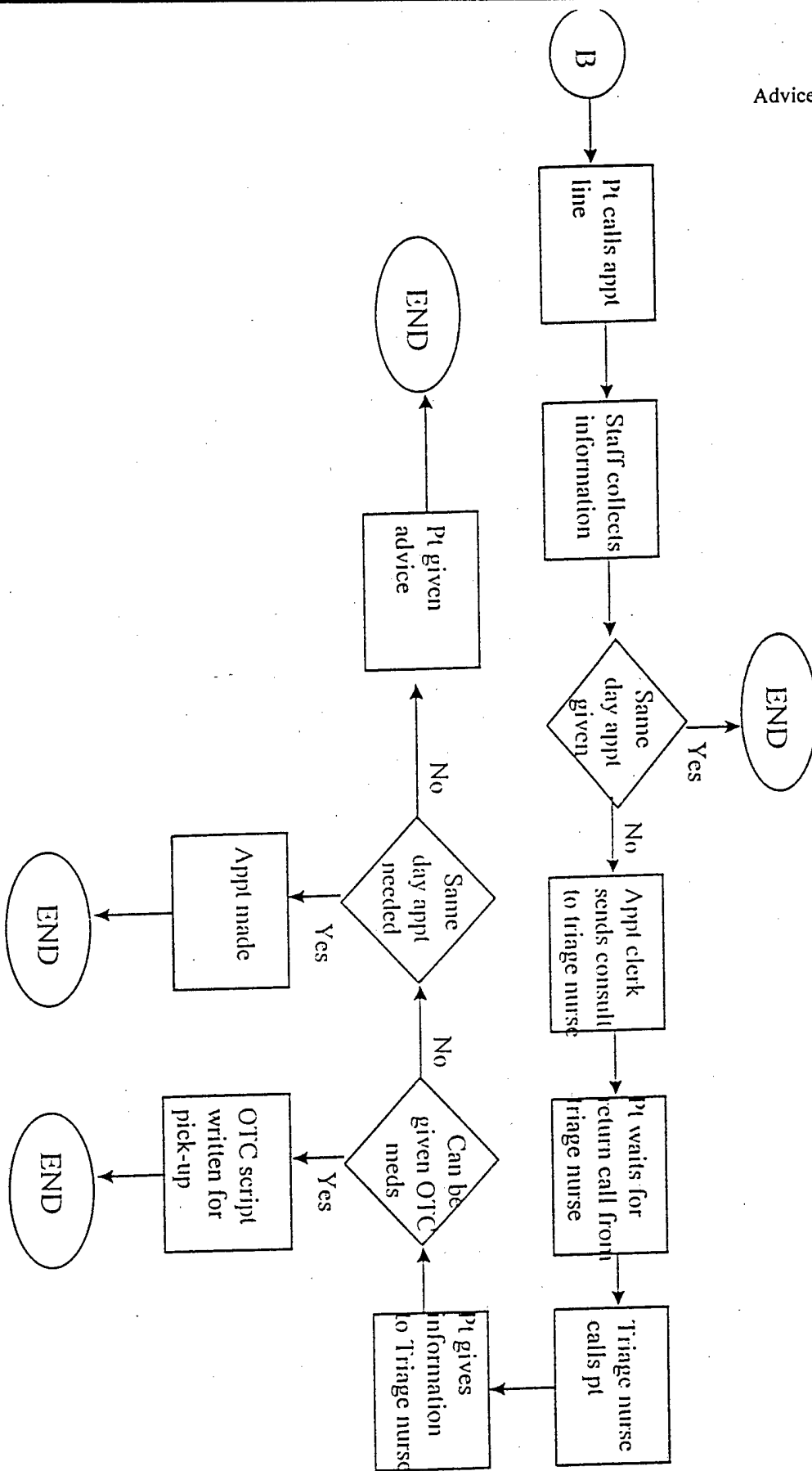


Figure 5 (continued). Flowchart of current patient encounters when calling the TLC.

## Flowchart of Combined Line

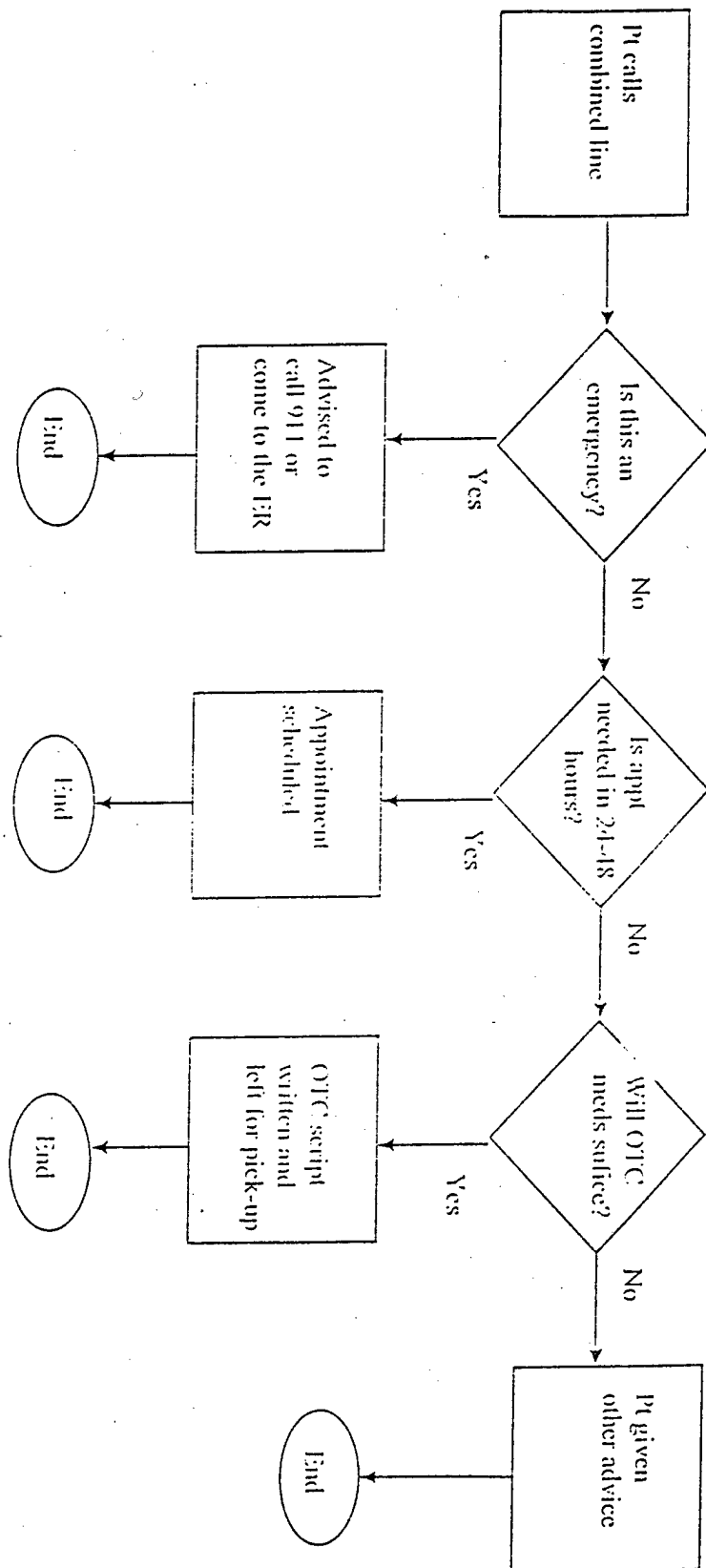


Figure 6. Flowcart of proposed combined advice and triage line.

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